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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: **Yoshikazu TAKEDA et al.**

Serial No.: **Not yet Assigned**

(§371 of international application No. PCT/JP2003/007577)

Filed: **June 16, 2005**

For: **SEMICONDUCTOR MULTI-LAYERED STRUCTURE WITH NON-UNIFORM QUANTUM DOTS, AND LIGHT EMITTING DIODE, SEMICONDUCTOR LASER DIODE AND SEMICONDUCTOR LIGHT AMPLIFIER USING THE SAME AS WELL AS METHOD OF MAKING THEM**

Attorney Docket Number: **052712**

Customer Number: **38834**

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Date: June 16, 2005

Sir:

In compliance with 37 C.F.R. §1.56, Applicants direct the attention of the Patent and Trademark Office to the documents listed on the attached PTO/SB/08. A copy of each non-U.S. document is enclosed herewith.

In the event there are any fees due in connection with the filing of this paper, please charge Deposit Account No. 50-2866.

Respectfully submitted,

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Enclosure: PTO/SB/08, 15 documents and international search report.

<b>Combined Form PTO/SB/08A&amp;B</b>  <b><u>INFORMATION DISCLOSURE</u></b> <b><u>STATEMENT BY APPLICANT</u></b>  <i>(use as many sheets as necessary)</i>				<i>Complete if Known</i>	
				Application Number	New Application
				Confirmation Number	
				Filing Date	June 16, 2005
				First Named Inventor	Yoshikazu TAKEDA et al.
				Art Unit	
Examiner Name					
Sheet	1	of	2	Attorney Docket Number	052712

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number	Kind Code <sup>2</sup> (if known)		
	1	US 2001/0028755 A1		10-11-2001	Tomoyuki AKIYAMA

FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Translation <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
	2	JP	2002-43696		02-08-2002	Fujitsu Ltd. (Cited in the Int'l. search Rpt)	Abstract
	3	JP	9-326506		12-16-1997	Fujitsu Ltd. (Cited in the Int'l. search Rpt)	Abstract
	4	JP	2001-255500		09-21-2001	Fujitsu Ltd. (Cited in the Int'l. search Rpt)	Abstract
	5	JP	2000-196065		07-14-2000	Fujitsu Ltd. (Cited in the Int'l. search Rpt)	Abstract
	6	JP	2000-340883		12-08-2000	Fujitsu Ltd. (Cited in the Specification)	Abstract

NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	Translation <sup>6</sup>	
	7	Y. NONOGAKI et al.; "Formation of InGaAs dots on InP substrate with lattice-matching growth condition by droplet heteroepitaxy", Inst. Phys. Conf. Ser. No. 162, Chapter 9, 1999, pp.469-473. (Cited in the Int'l. search report).	Yes	
	8	Y. ARAKAWA et al.; "Multidimensional quantum well laser and temperature dependence of its threshold current", Appl. Phys. Lett. Vol.40, No. 11, June 1, 1982, pp.939-941. (Cited in the Specification).	Yes	
	9	M. ASADA et al.; "Gain and the Threshold of Three-Dimensional Quantum-Box Lasers", IEEE Journal of Quantum Electronics, Vol. QE-22, No. 9, Sept.1986, pp.1914-1921. (Cited in the Specification)	Yes	
	10	K. J. VAHALA, "Quantum Box Fabrication Tolerance and Size Limits in Semiconductors and Their Effect on Optical Gain", IEEE, J. Quantum Electronics, Vol.24, No. 3, March 1988, pp.522-531. (Cited in the Specification)	Yes	
	11	H. SAKAKI; "Quantum Wire Superlattices and Coupled Quantum Box Arrays: A Novel Method to Suppress Optical Phonon Scattering in Semiconductors", Jpn. J. Appl. Phys, Vol. 28, 1989, pp.L314-L316. (Cited in the Specification).	Yes	
	12	N. KIRSTAEDTER et al.; "Low threshold, large T <sub>0</sub> injection laser emission from (InGa) As quantum dots", Electronics letters, Vol. 30, No. 17, Aug. 18, 1994, pp.1416-1417. (Cited in the Specification).		
	13	Y. NONOGAKI et al.; "InAs dots grown on InP (001) by droplet hetero-epitaxi using OMVPE", Mat. Sci. & Eng., Vol. B51, 1998, pp.118-121. (Cited in the Specification).	Yes	

Examiner Signature	Date Considered
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	14	R. OGA et al.; "Room temperature electroluminescence at 1.55 $\mu$ m from InAs quantum dots grown on (001) InP by droplet hetero-epitaxy); 10 <sup>th</sup> Int. Sump. Nanostructures: Physics and Technology, St. Petersburg, Russia, June 17-21, 2000.	Yes
	15	Woo-Sik LEE et al.; "Fabrication and Application of InAs quantum dots by droplet-hetero epitaxy on GaInAsP and AlInAs lattice-matched with InP substrate" The Institute of Electronics, Vol. 103, No. 47.	Abstract

Examiner Signature	Date Considered
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